## (19) World Intellectual Property Organization International Bureau



# 

(43) International Publication Date 9 June 2005 (09.06.2005)

### **PCT**

# (10) International Publication Number WO 2005/052487 A1

(51) International Patent Classification<sup>7</sup>: 13/02, F28D 9/00 // F28F 3/08

F28F 3/04,

(21) International Application Number:

PCT/SE2004/001694

(22) International Filing Date:

19 November 2004 (19.11.2004)

(25) Filing Language:

Swedish

(26) Publication Language:

English

(30) Priority Data: 0303142-4 26 November

26 November 2003 (26.11.2003) S

- (71) Applicant (for all designated States except US): ECO LEAN RESEARCH & DEVELOPMENT A/S [DK/DK]; Holbergsgade 14, 2 sal tv, DK-1057 Copenhagen (DK).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): RAUSING, Hans [SE/GB]; P.O. Box 216, Wadhurst, East Sussex, TN5 6LW (GB).
- (74) Agent: AWAPATENT AB; Box 5117, S-200 71 Malmö (SE).

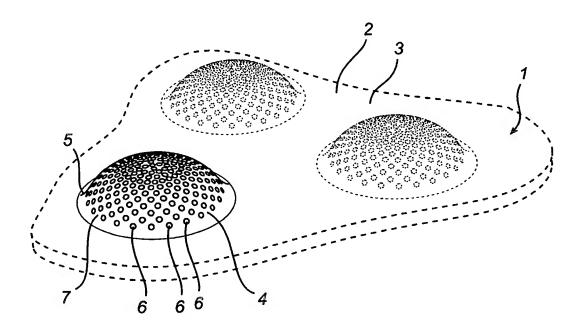
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,

[Continued on next page]

(54) Title: HEAT EXCHANGER PLATE AND PLATE HEAT EXCHANGER COMPRISING SUCH PLATES



(57) Abstract: The invention relates a heat exchanger plate (1) comprising a number of turbulence-promoting protuberances (4) that project from the plane (3) of the heat exchanger plate. The protuberances (4) have a surface profile (6) for promoting break-up of laminar boundary layers. The invention also relates to a plate heat exchanger comprising such heat exchanger plates (1).

# WO 2005/052487 A1



JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- of inventorship (Rule 4.17(iv)) for US only

## Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.